

**Asia Region Biennial IASC Meeting July 13-16, 2018  
AIT, Bangkok, Thailand**

**Can collaborative forest governance be a  
win-win solution to the conflicts of interests  
between local people and the general public?**

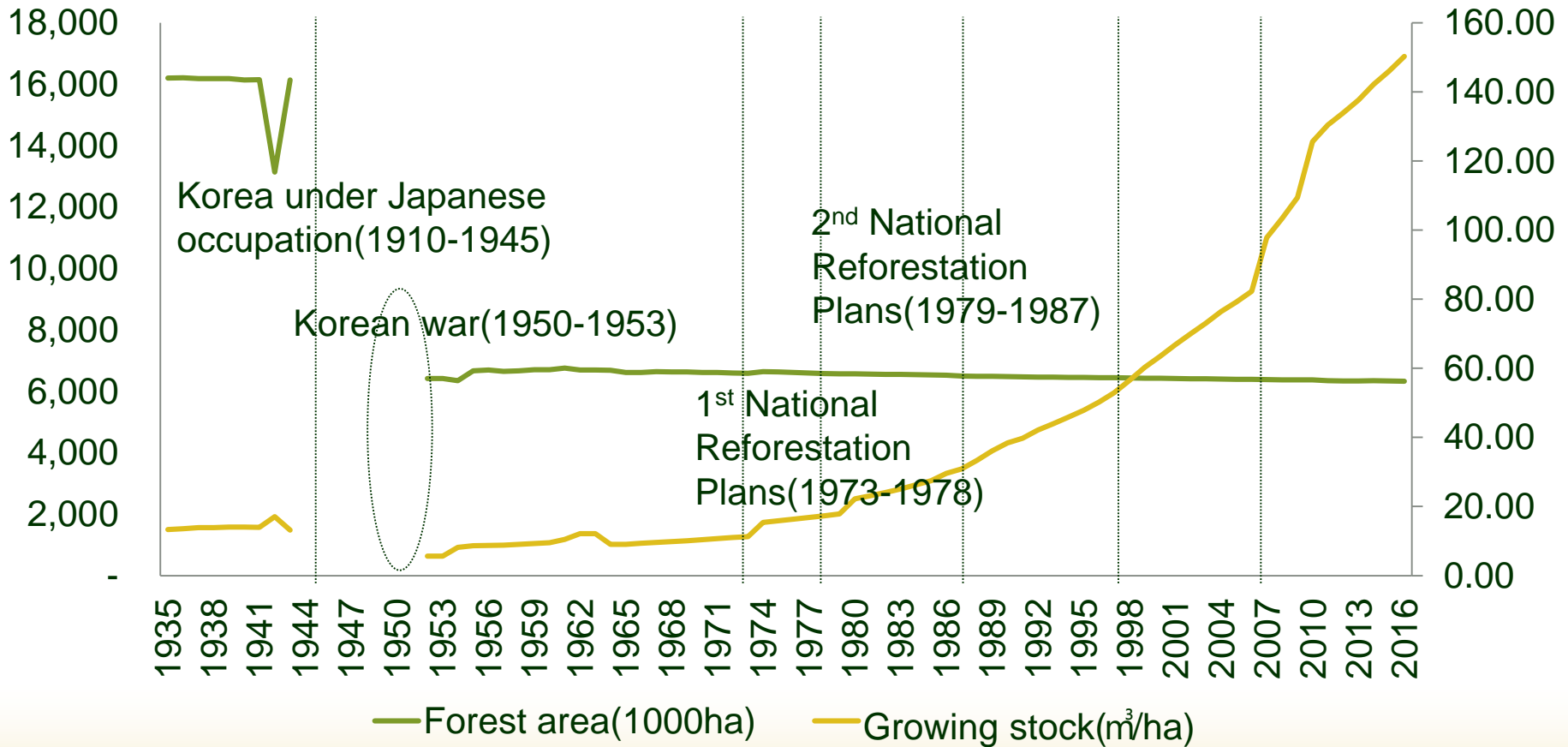
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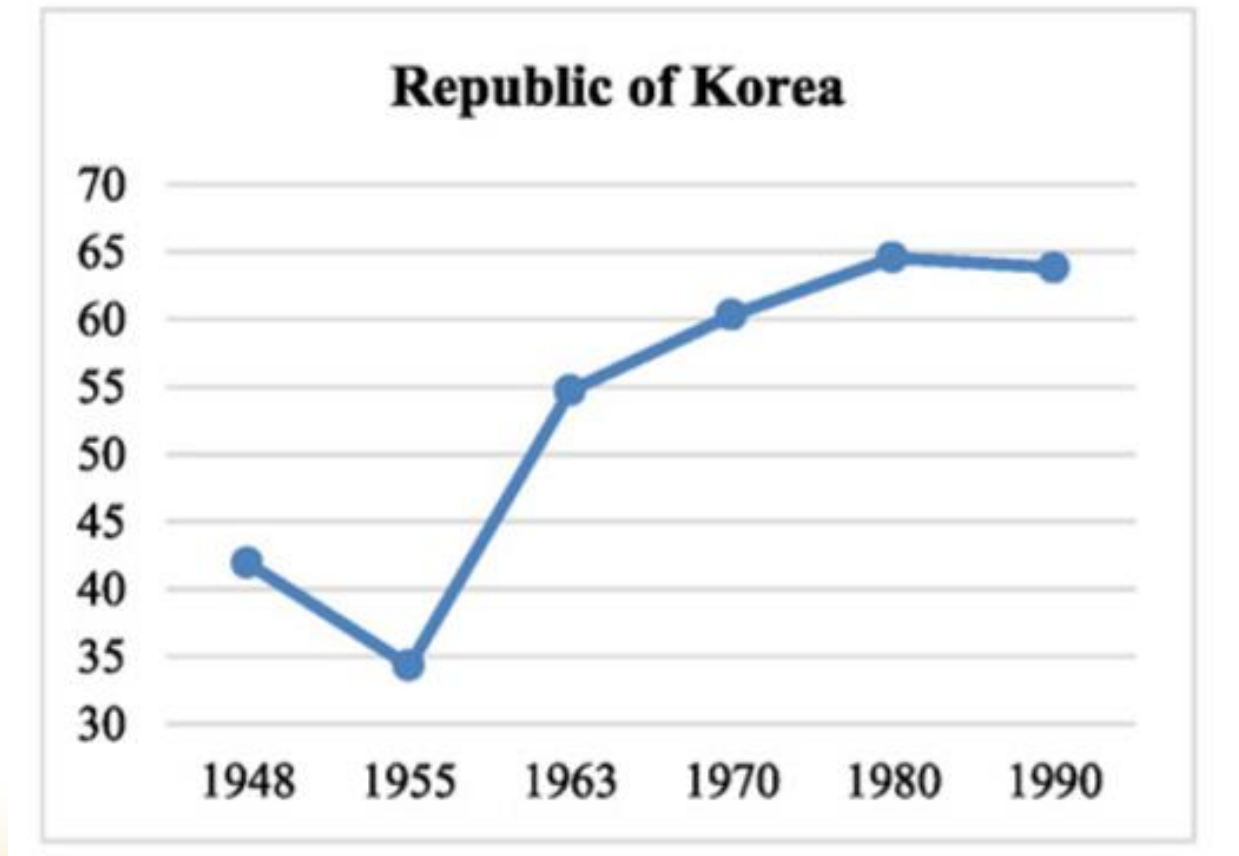
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# Forest change in South Korea



# Forest change in South Korea

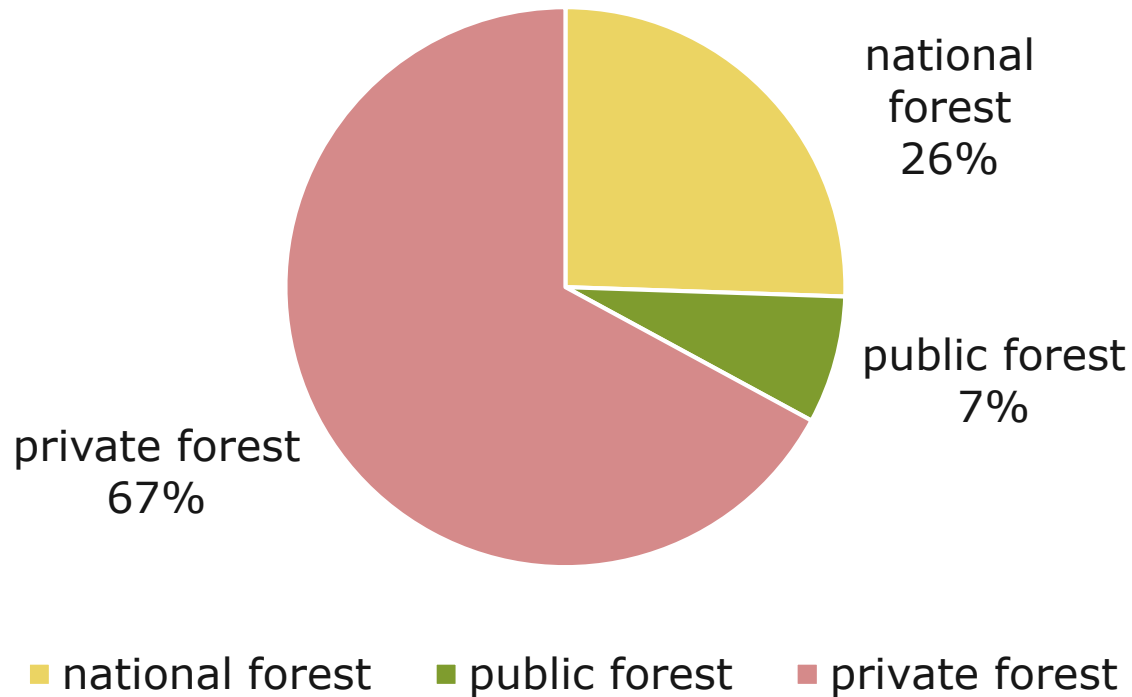
Fig. 1.Changes of ratio of total forest areas to total land areas by year.



Sources: Youn Yeo-Chang et al. (2017)

# Forest resources governance in the Republic of Korea

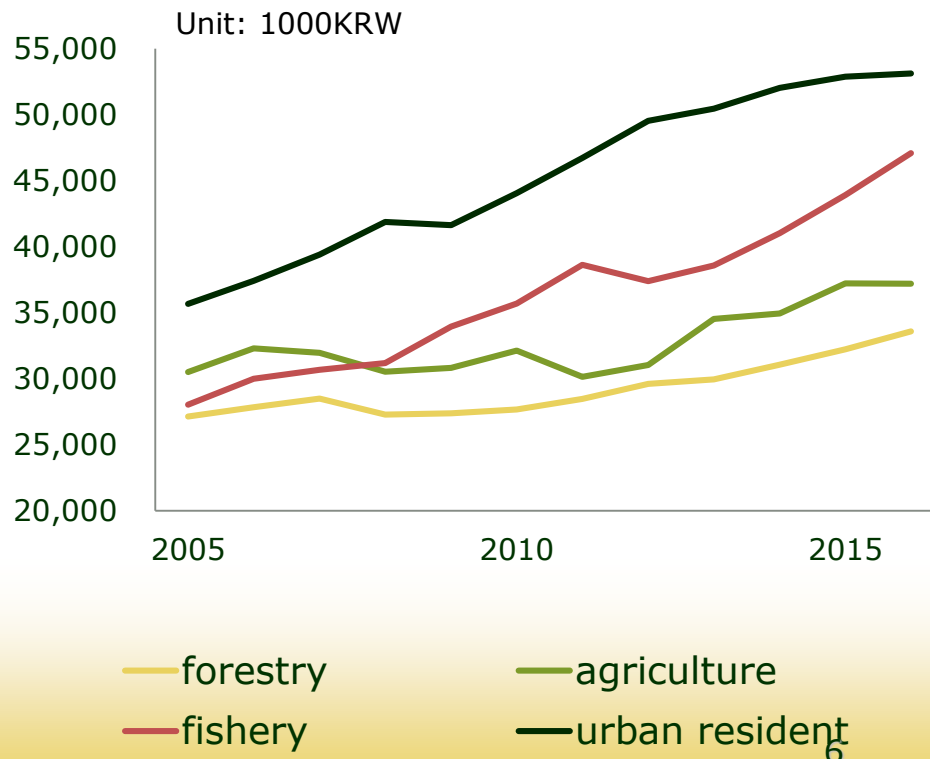
## Ownership of forest(2016)



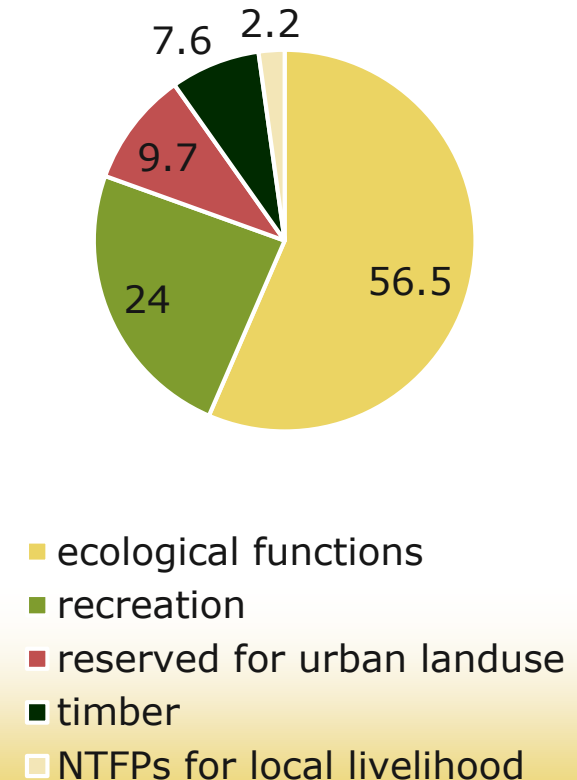
# Research background and agenda

- Forest dependent communities are relative poor.
- Diverse interests in forest ecosystem services

## Household income by sector



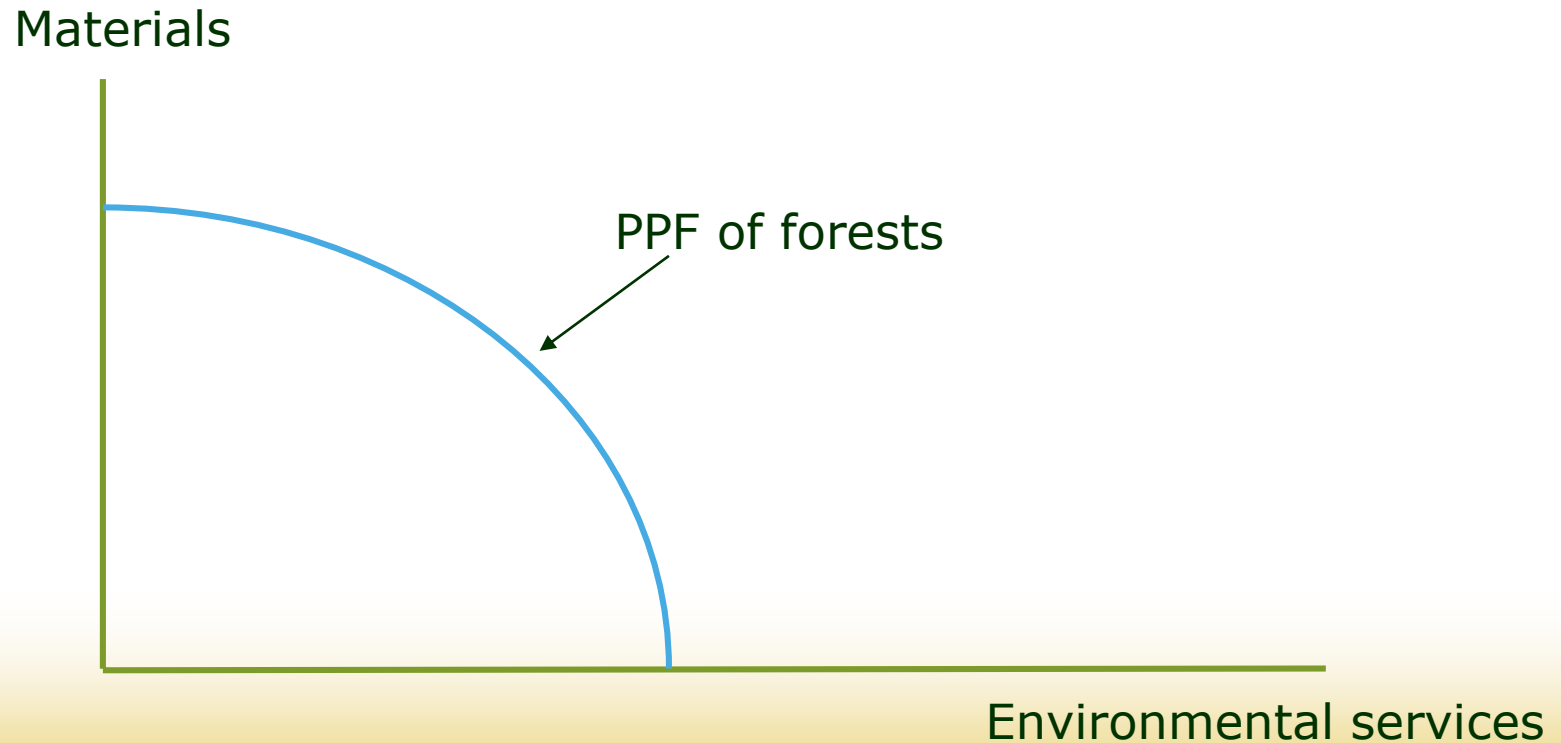
## Korean peoples' Demand for national forest services (2015)





# A hypothesis

- There could be a trade-off between provision of materials and environmental services.



# National forest management in history



article 10, in indispensable national forest, making communities protect national forests by local residents, in return providing access rights to national non-timber forest products with duties of protecting national forest(lee, 2010)



# National forest governance of the Participatory Government

- The participatory Government(2003-2008)

	Solidarity protection with Forestry Cooperatives etc.	National Forest Protection Contract
Relevant legislation	Forest law (1961) article 74, its implementing ordinances article 4, 5,60 its implementing regulation article 57	Law of national forest management (2006) article 11, its implementing ordinances article 8, 28, 29 its implementing regulation article 9
Subject of contract	Forestry Cooperatives, Schools, forest skilled forestry contractors	Forestry Cooperatives, <b>local residents</b> , Schools, forest skilled forestry contractors

# The right and duty of local residents

## Rights

- Biomass
- NTFPs



## Duties

- Fire patrol
- Vigilance against & reporting illegal collection of native plants and NTFPs
- Cooperation for maintenance of forest facilities like forest road and erosion control facilities, etc.

# Research question

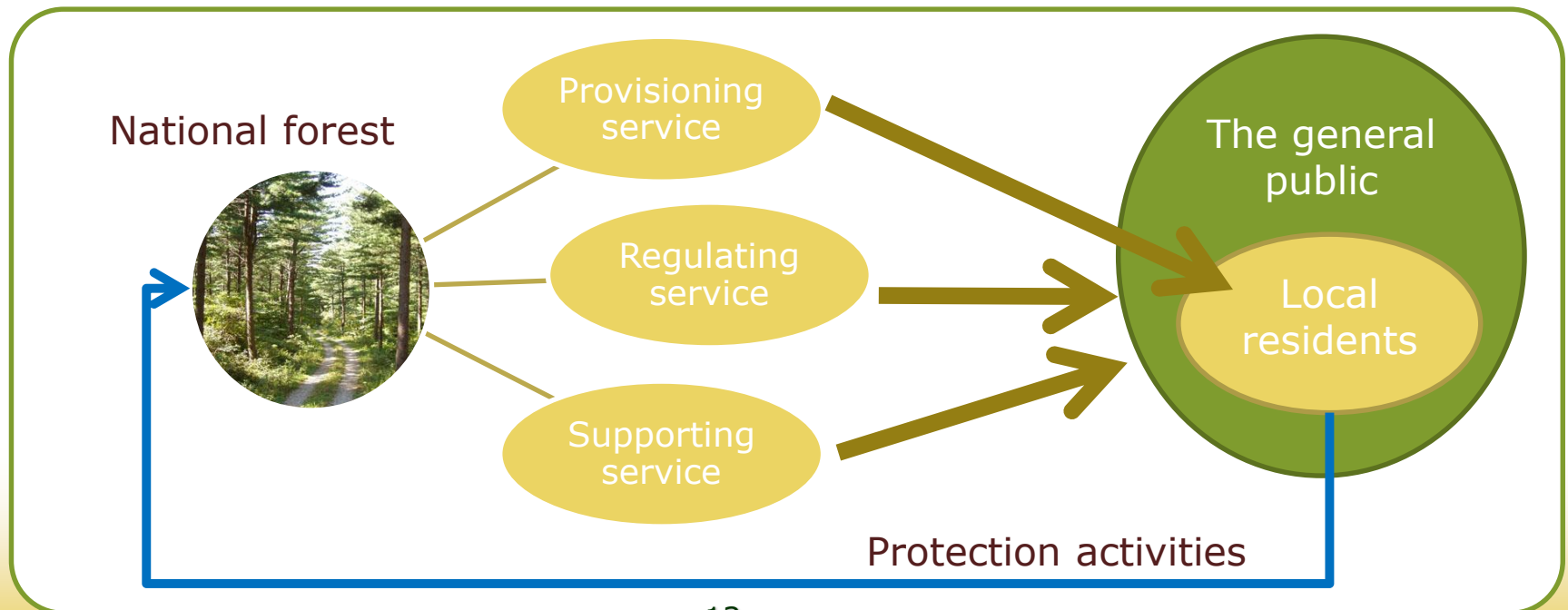
- Can the NFPC scheme as a collaborative forest governance resolve the problem of conflicting interests in national forest management?
  - Citizens in urban areas demand more environmental services from forests, in particular public forests while local people residing nearby public forests depend on forests for ecosystem services in particular NTFPs.
  - There has been little empirical research on effect of collaborative forest governance on compatibility of environmental conservation and economic development

# Research objective

- The objective is to assess the impact of National Forest Protection Contract (NFPC) scheme on efficiency of national forest management in Korea.
- We want to verify whether the NFPC can help the trade-offs not cause conflicts of interests in diverse ecosystem services.

# Research hypotheses

- ◆ **H1. NFPC improves efficiency of forest management.**
  - The more local people participating, the higher efficiency of the forest management in terms of ecosystem services.



# Data analysis

1<sup>st</sup> step

- **Estimation of ecosystem service efficiency**

- Relative efficiency of ecosystem services in the 27 national forest management districts using data envelopment analysis(DEA)

2<sup>nd</sup> step

- **grouping national forest management districts**

Into three groups based on number of villages under the NFPC

3<sup>rd</sup> step

- **Analysis for the effect of NFPC on ES efficiency of national forest management**

- Comparing pre-execution period from 2003 to 2005 with post-execution period from 2006 to 2014



# Data

- Data of 27 national forest management districts was collected by Korea Forest Service statistics for the period 2003 to 2014.

Input	Output	
Number of forest government employees	Provisioning services	Value of non-timber forest products (nuts, sap, wild vegetables, mushroom)
Forest land area(ha)	Regulating services	Carbon absorption
	Supporting services	Forest area - Forest fire damages area

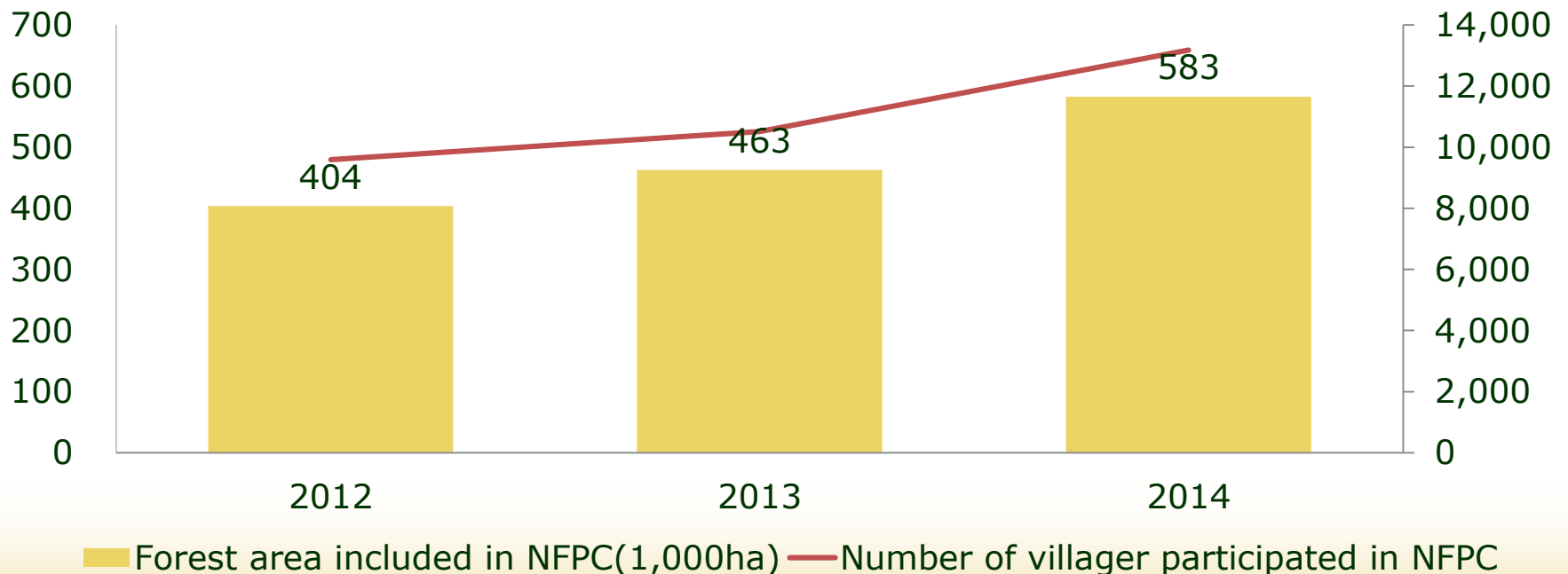
# Calculation of forest management efficiency

- ◆ Efficiency is defined as the ratio of output/input in terms of distance from the most efficient unit.
- ◆ Output of provisioning services was calculated in terms of value of timber and NTFPs.
- ◆ Output of regulating services was calculated in terms of carbon sequestrated by the forest.
- ◆ Output of supporting services was calculated in terms of habitats protected from forest fires.

# Results

## ◆ Status of NFPC scheme

- Percentage of areas under the contract has increased from 29.13% in 2012 to 42.04% in 2014.



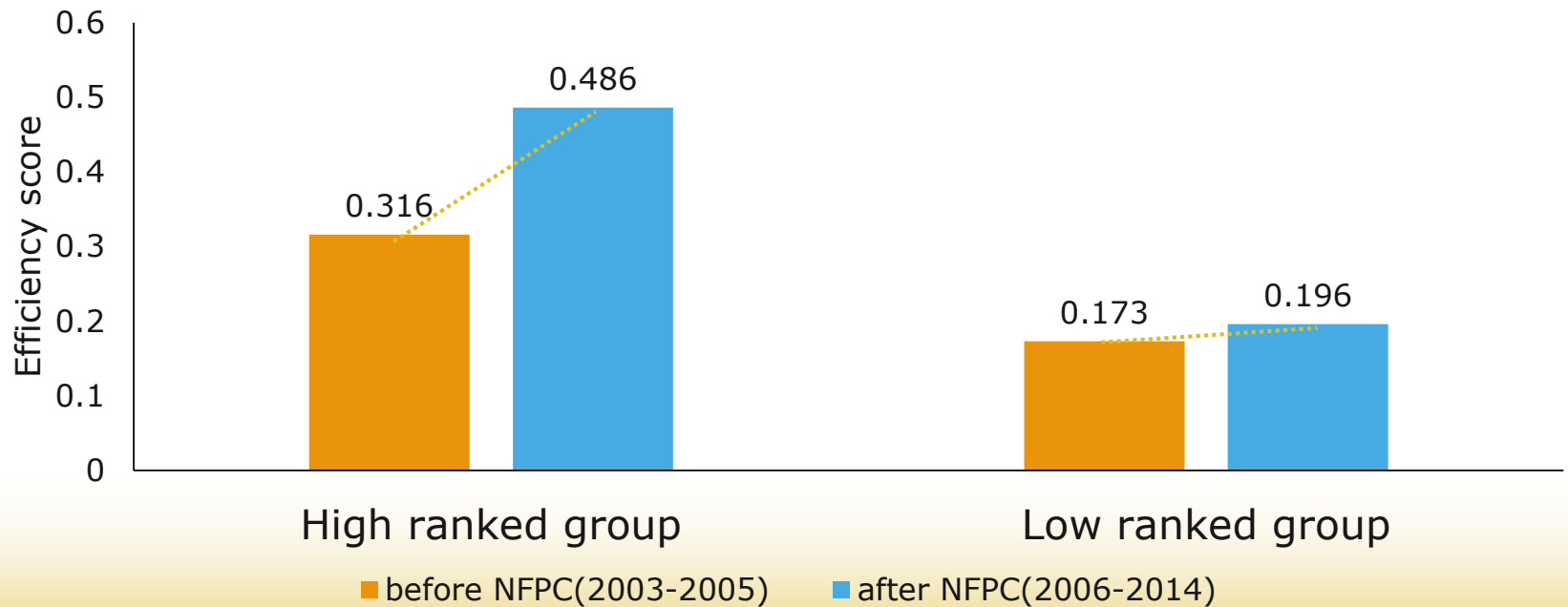
# Difference of efficiency of ecosystem services before and after NFPC implement

- ◆ Difference of efficiency of ecosystem services between national forest groups with more and less local participation in NFPC

Mann-Whitney Test	Provisioning Service		Regulation Service		Supporting Service	
	before NFPC	after NFPC	before NFPC	after NFPC	before NFPC	after NFPC
Mann-Whitney U	29.00	158.00***	27.00	243.00**	23.00	190.00***
Wilcoxon W	74.00	536.00***	72.00	621.00**	68.00	568.00***
Z	-1.022	-3.581	-1.201	-2.113	-1.553	-3.031
Asymp. Sig. (2-tailed)	0.307	0.000	0.230	0.035	0.121	0.002

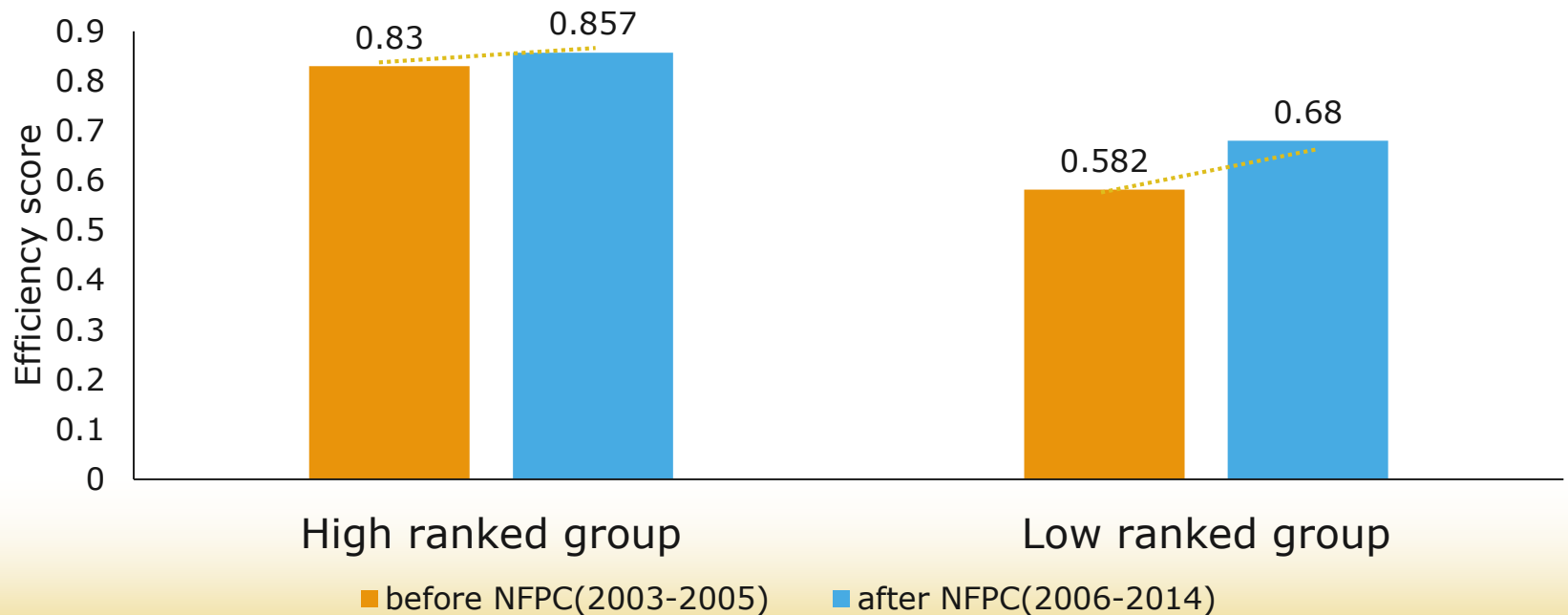
## ◆ Difference of efficiency of ecosystem services regarding NFPC activation

■ Provisioning service



## ◆ Difference of efficiency of ecosystem services regarding NFPC activation

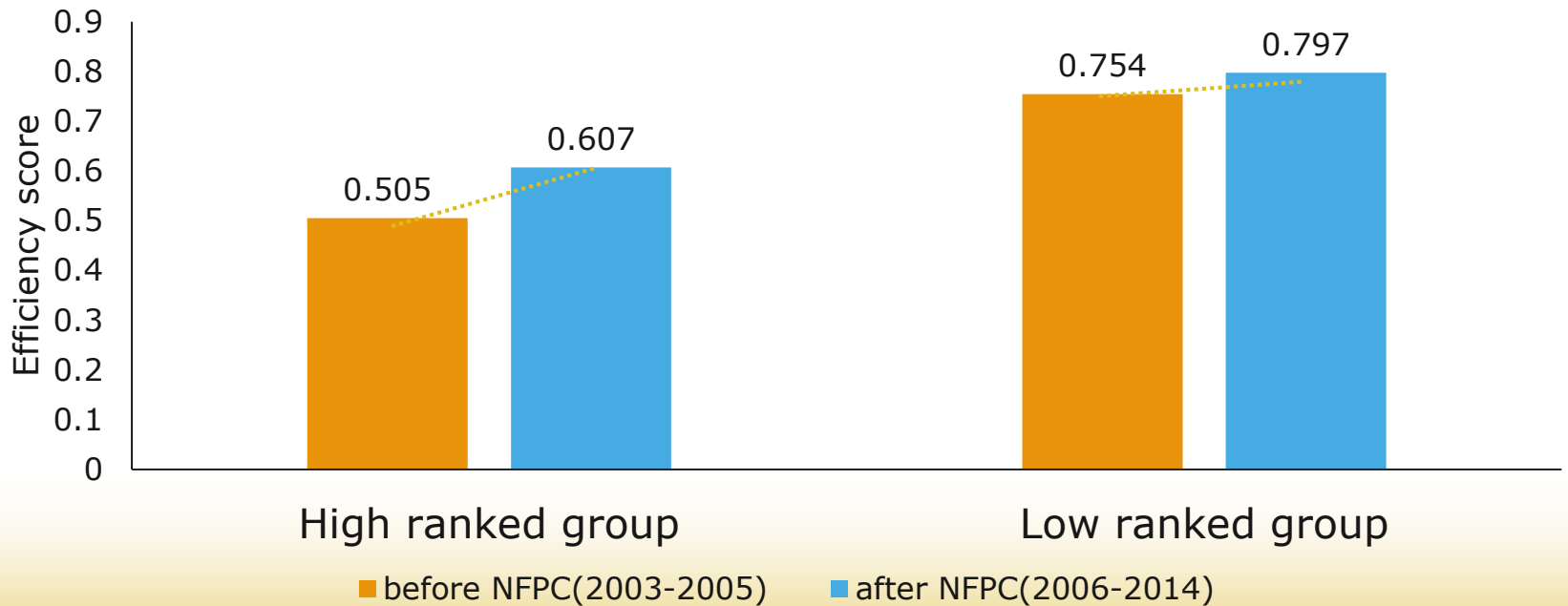
■ Regulating service





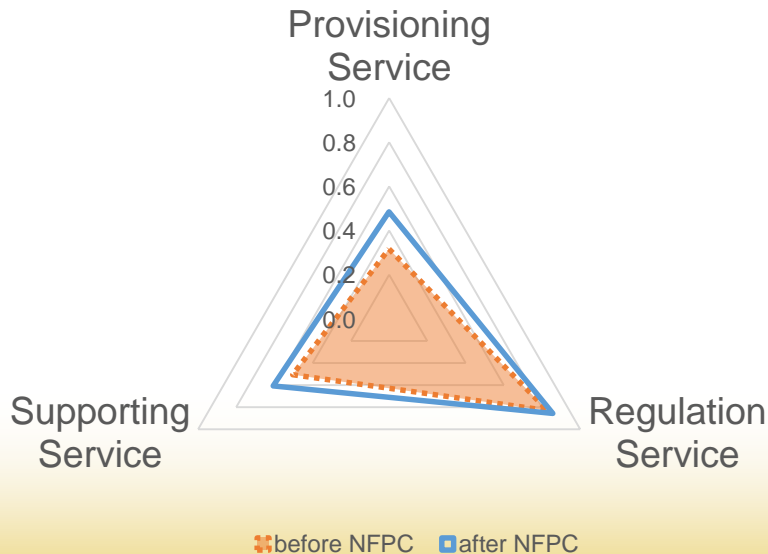
# ◆ Difference of efficiency of ecosystem services regarding NFPC activation

■ Supporting service

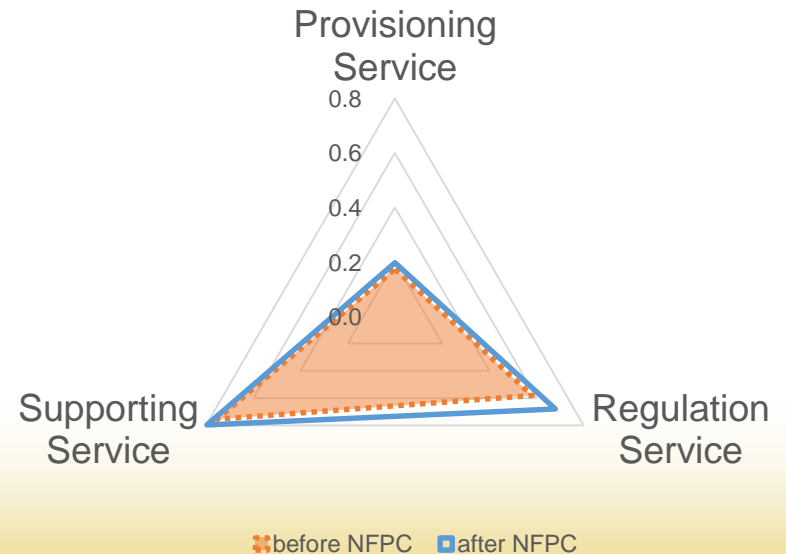


# ◆ Change of efficiency of ecosystem services before and after NFPC implementing

## High ranked group



## Low ranked group



# Discussions

- ◆ Policy change in the government allowed citizens' participation in decision-making of forest management since 2003.
- ◆ NFPC has provided local residents with economic incentives in terms of access to non-timber forest products who collaborate with the Government for forest protection activities.
- ◆ Efficiency in provisioning services increased as collaborative governance expanded in the national forests with more local people engaged in national forest management while efficiency of supporting & regulating services in terms of habitat protection was not reduced.

# Discussions

- ◆ NFPC as a collaborative forest governance can contribute to solve the dilemma of environmental conservation and livelihood of local communities.
- ◆ The government should design and implement policy and institutional mechanisms for inducing citizen, in particular local people to participate in forest management in order to resolve the potential conflicts of interests in ecosystem services.

# Future work

- ◆ The difference in efficiency of ecosystem services among national forests may be due to other factors including biophysical/socio-economics conditions and other institutional arrangements.
- ◆ The availability of data on ecosystem services from national forests limited to the analysis for only a sub-set of ES in this study.
- ◆ We need to study on the impact of collaborative governance on biodiversity and water supply.

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A photograph of a forest path with trees showing autumn foliage in shades of yellow and orange. The path is slightly blurred, suggesting a shallow depth of field. In the foreground, a large, vibrant green leaf is visible, partially obscuring the bottom of the frame. The overall lighting is soft and natural.

Thank You !

